

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE

MR. AND MRS. HENRY SIDGWICK contribute each 500*l.* to the building fund (11,000*l.* being required) for the new hall to be built at Newnham, Cambridge, for women students, under the "Newnham College Association" for the advancement of education and learning among women in Cambridge. Miss Clough, the principal of Newnham Hall, whose unpaid services are of incalculable value, also gives 500*l.* to this new building, which will include lecture-rooms, &c., as well as residence for thirty. Prof. and Mrs. J. C. Adams, Dr. and Mrs. Bateson, Mr. and Mrs. Peile, &c., are among the large donors, and the Rev. Coutts Trotter, of Trinity College, is a donor of 100*l.*

THE Chemical Laboratory of Newnham Hall, which has cost over 1,000*l.*, is now complete, and will be available for all the students of the Newnham Association. So also will be the Gymnasium and Garden. The Old Newnham Hall company is now merged in the new association, differing from the former in the contributors not being permitted to receive any profits. It is needless to add that the old association did not actually receive any profits, though registered as an ordinary "limited" liability company.

THE main purpose of the Irish University Bill, introduced to the House of Lords on Monday by Government, seems to be the creation of an institution similar to that of London University, prepared to grant degrees to all comers. In order to do this Government propose to establish a new University, to consist of a Chancellor and Senate to be appointed by the Crown, and not to exceed thirty-six in number. But though nominated in the first instance by the Crown, arrangements would be made to fill up a certain number of the vacancies afterwards, so that Convocation might have the election of six members of the Senate. The Government proposed, with regard to the Convocation, that it should consist of the graduates who had obtained their degrees in this University, or any one who might be transferred to or become graduates from the other University. The Government proposed that the Senate should elect the Vice-Chancellor, and also that the new University thus constituted should appoint examiners and conduct examinations for matriculation and degrees, and that it should confer degrees in all faculties except theology. They proposed that those degrees should be granted without regard to residence in any particular college, that the examinations for those degrees should be with regard to the standard of efficiency only, and that the degrees should be conferred on all who came up to the standard, and they proposed that there should not be any professors or lecturers connected with the University, thus following the example of the University of London. The Government are of opinion that steps should be taken for the dissolution of Queen's University, and that graduates of Queen's should become graduates of the new University, and those who were matriculated students of one should be so of the other, and possess all the same privileges and advantages in the new University as they did in Queen's.

FIVE years ago, when the late Lord Lawrence publicly presented the first Mortimer Scholarship Prize, Prof. Huxley made a speech which has proved prophetic. It was to the effect that the ladder of Board School education planted in the gutter might land such lads as Baker in the highest universities. That lad enjoyed his Mortimer Scholarship (worth 30*l.*) one year. He then obtained a scholarship in the City of London School. In four years more he obtains an open scholarship in Trinity College, Cambridge, at seventeen years of age. An immediate result of this success of the Elementary Education Act is that the Brewers' Company have since presented two scholarships to the London School Board.

It was stated in Parliament on Monday that a petition having been presented to the Queen in Council, praying Her Majesty to grant a charter for a new Northern University, to be called the Victoria University, Her Majesty had been advised to grant the petition.

## SCIENTIFIC SERIALS

*Annalen der Physik und Chemie*, No. 5.—From experiments, here described, on magnetisation of steel during the hardening process, Herr Holtz concludes that the method offers no advantages in practice. Magnets can, indeed, be thus made six times

as strong as by the ordinary method, but this holds good only for extremely weak magnetising force; as you increase the force the difference rapidly decreases, and ere long becomes in favour of the ordinary method.—Herr Schellbach and Herr Boehn describe some instructive effects got on plates covered with carbon-dust placed under a discharger of a Leyden jar. Various devices were introduced for reflection, &c., of the sound-waves, whose mechanical action is indicated by the resultant figures on the plates.—Herr Wroblewski finds that a tenfold increase of the viscosity of water (by dissolving a crystalloid or colloid in it) produces only a five or six-fold diminution of the value of the constant for diffusion of carbonic acid in pure water.—The lowering of tone undergone by a sounded tuning-fork when immersed in liquids having been attributed by Herr Auerbach to the circumstance that kinetic energy is dispersed in incompressible liquids in another way than in gases (the changes of state in liquids being supposed to occur isothermally, in gases isentropically), Herr Kolacek offers another explanation based on mechanical principles.—In an inaugural dissertation Herr Freund writes on some galvanic properties of aqueous metal-salt solutions, his experiments having been made by Paalzwow's method; and the results for sulphate of copper solution differing about 5 per cent. from those formerly obtained by Herr Beetz, he offers an explanation of this; which, however, Herr Beetz rejects, adhering to his own numbers.—Herr Ketteler contributes a paper on the theory of double refraction, and Herr Rammsberg writes on some topics in mineralogical chemistry.

*Morphologisches Jahrbuch*, vol. 5, part 1.—This number contains no fewer than thirteen lithographic plates. Three of these illustrate Oscar Hertwig's second part of his memoir on the piscine dermal skeleton. He deals now with the ganoids (*Lepidosteus* and *Polypterus*).—R. S. Bergh, on the early development of the ovum of *Gonothyraa loveni* (Allman), 2 plates, 40 pages.—G. Born, the nasal cavities and passages of the amniotic vertebrata (3 plates, and about 80 pages).—O. Kling on *Craterolophus tethys*, a contribution to the anatomy and histology of the Lucernaridae (3 plates, 26 pages).—A. Rauber, on the occurrence of budding among the vertebrata (2 plates).

*Zeitschrift für wissenschaftliche Zoologie*, vol. 32, part 2.—J. E. Boas, the teeth of the Saroids (25 pages).—R. Wiedersheim, the anatomy of *Amblystoma weismanni*, with two large coloured plates.—R. Greef, the pelagic annelids of the Canary Islands (45 pages, 3 plates); with discussions on the comparative anatomy of the Tomopteridae, and figures and descriptions of *Pontodora*, &c., and several new species of Tomopteris.—H. Simroth, on the locomotion of *Limax*; two plates figuring *L. cinerconiger*.—J. Ciamician, on the histology and embryology of *Tubularia mesembryanthemum* (25 pages, 2 plates).

*Kosmos*, vol. 3, part 1, April, 1879.—The first article, "Natural Science in the Middle Ages," by Fritz Schultze, refers especially to Roger Bacon.—The controversy about *Planorbis multiformis* (1st art.), by F. Hilgendorf, is, among other figures, illustrated by a series of outlines of the different varieties of *P. multiformis*, as seen in section, &c., and referring to Sandberger's views.—Hermann Müller contributes an article of 16 pages, on Samuel Butler's "Life and Habit."

*Reale Istituto Lombardo di Scienze e Lettere, Rendiconti*, vol. xii. fasc. x.—We note here the following:—Researches on the electric conductivity of carbon (continued), by Prof. Ferrini.—On a surface of capillarity, by Dr. Poloni.—Influence of climate and soil on the combustibility of tobaccos, by S. Cantoni.

*Journal de Physique*, June.—Spectroscope for observation of ultra-violet radiations, by M. Cornu.—Spectrometric measurement of high temperatures, by M. Crova.—Magnetic rotatory power of gases, by M. H. Becquerel.—Magnetic rotatory power of liquids and their vapours, by M. Bichat.

## SOCIETIES AND ACADEMIES

## LONDON

Royal Society, June 19.—"Researches in Chemical Equivalence. Part III.—Nickelous and Cobaltous Sulphates." By Edmund J. Mills, D.Sc., F.R.S., and J. J. Smith.

Although the chemistry of nickel and cobalt is interesting from many points of view, it is more especially attractive from the probable isomerism of these metals. Their combining proportions, in fact, according to the most valuable evidence we possess, appear to be entirely the same. The authors, therefore,

thought it very advisable to inquire on what terms these metals might prove to be mutually equivalent: and the particular equivalence they have examined has been equivalent precipitability of the sulphates, by sodic hydrate, from an aqueous solution.

After describing the mode of preparation of the pure sulphates, the authors give an experimental criticism of the methods of separating nickel from cobalt, finally adopting the one devised by Gibbs. Having then fixed on the method of separation, 1 per cent. solutions of nickelous and cobaltous sulphates were prepared, and a solution of sodic hydrate, of which 10 cub. centims. were capable of precipitating '8248 grm. of nickelous or cobaltous sulphate. This sodic hydrate was made from sodium, and kept in glass bottles coated internally with a thick layer of paraffin.

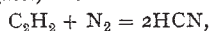
A series of nine experiments was made, in which the relative weights of nickelous or cobaltous sulphate present, varied from '1 to '9 grm.; the total weight of nickelous and cobaltous salt, and the volume of the solution being, however, always the same, viz., 1 grm. and 100 cub. centims. The experiments were conducted as follows:—The bottles containing the solutions of the sulphates and the sodic hydrate were immersed in a trough into which there was a constant flow of water to bring them to a constant temperature. The necessary quantities of nickelous and cobaltous solutions were then carefully measured out, mixed, and the temperature observed. 10 cub. centims. of sodic hydrate was then added, the solution stirred vigorously, and the temperature again observed. The precipitate was then filtered off as quickly as possible (an aspirator being used to facilitate the filtration), and washed, first with cold and then with hot water. It contained sodic sulphate, cobaltous sulphate and hydrate, and nickelous hydrate, all of which were analytically determined.

If  $n$  represent a weight of nickelous sulphate taken, and  $\nu$  be the hydrate (calculated to sulphate) obtained from it through precipitation, the experiments show that  $n = (1 + '21940 \nu) \nu$ . Similarly, for cobalt,  $c = 1'1845 \nu$ . The authors give the following conclusions as the result of a discussion of their work:—(1) *The precipitability of nickelous sulphate is directly proportional to its mass*; (2) *The precipitability of cobaltous sulphate is an invariable quantity*; (3) *For an equal weight nickelous and cobaltous sulphates are equally precipitable; the attraction of the one towards the reagent being then inverse to that of the other.*

They accordingly write  $\phi(\text{NiSO}_4) = (\phi \text{CoSO}_4)^{-1}$ .

"On the Formation of Hydrocyanic Acid in the Electric Arc." By James Dewar, M.A., F.R.S., Professor of Chemistry to the Royal Institution.

The inference drawn from experiments given in the paper is that the reaction is in all probability the result of acetylene reacting with free nitrogen, as when induction sparks are passed through the mixed gases, viz.—



and that the hydrogen is obtained from the decomposition of aqueous vapour, and the combined hydrogen in the carbons. It is possible, traces of alkaline salts in the carbon poles may favour the formation of hydrocyanic acid, but, as all attempts to purify the poles so as to stop the reaction failed, I am inclined to believe it is a direct synthesis. The acetylene reaction is one of the many remarkable syntheses discovered by Prof. Berthelot of Paris. The presence of sulphuretted hydrogen is doubtless due to the reduction of the sulphates, invariably present in the ash of the carbon.

"An Account of Experiments on the Influence of Colloids upon Crystalline Form, and on Movements observed in Mixtures of Colloids with Crystalloids." By William M. Ord, M.D. Lond., F.L.S. Communicated by J. Simon, C.B., D.C.L., F.R.S.

Chemical Society, June 19.—Dr. Roscoe in the chair.—The following papers were read:—On Gardenin, by Dr. Stenhouse and Mr. C. E. Groves. This substance has been extracted from "Dekamali gum," the resin of the *Gardenia lucida*. Gardenin by treatment with nitric acid is converted into a mass of red crystals of gardenic acid; an acetyl derivative has been obtained. Gardenic acid in contact with sulphurous acid is converted into hydrogardenic acid.—On dry copper-zinc couples and analogous agents, by Dr. J. H. Gladstone and Mr. A. Tribe. By heating nine parts of coarse zinc filings with one part of finely divided copper in a flask over a Bunsen flame until the filings begin to lose their shape, dark grey granular masses are obtained. These masses constitute the dry copper zinc couple, which is found to

equal in activity the well-known moist copper-zinc couple, prepared by immersing zinc foil in copper sulphate solution; ten grammes of the dry couple convert 5 cc. of ethyl-iodide into zinc ethiodide in about six minutes. Couples of other metals were tried, but none were found to be in practice superior to that formed of copper and zinc.—On the action of sulphuric acid on the hydrocarbons of the formula  $\text{C}_{10}\text{H}_{16}$ , by Drs. Armstrong and Tilden. The authors deny the statement made by Ribau that the product of the above action yields a distillate when steam is passed through it consisting of cymene with a liquid isomeride of terpene; the so-called terebene is really inactive camphene, melting at  $47^\circ$ . The crude colophene remaining after the distillation in steam yields on distillation 10–30 per cent. of volatile substances—inactive camphene, terpinele, a paraffin-like body, an optically inactive camphor, &c.—Researches on the terpenes, camphor, and allied compounds, by Dr. Armstrong. Part I. On hydrocarbons associated with the terpenes, and on the formation of cymene from terpenes and allied compounds. II. On the action of iodine on terpenes. III. Camphor derivatives.—Contributions to the history of starch and its transformations, by Messrs. H. F. Brown and Heron. The authors have examined in a most elaborate manner the action of malt extract at various temperatures and under varied conditions, on potato starch.—On the determination of nitric acid by means of indigo, with especial reference to water analysis, by Mr. R. Warrington. The author gives the results of much experience with this process, which has the advantages of great simplicity, speed, and delicacy; the results are, however, conditioned by many circumstances which must be known before the method can be applied with delicacy.—Notes on the purple of the ancients, by Dr. E. Schunck. The author has worked up about 400 specimens of *Purpura lepillus*, a shell-fish found at Hastings, and extracted the cyst containing the yellowish secretion which in sunlight becomes purple and forms a permanent dye stuff. The colouring matter apparently belongs to an unknown member of the indigo-blue group.—On the heat of formation of aniline, picoline, toluidine, lutidine, pyridine, dipicoline, pyrrol, glycine, furfural, by W. Ramsay.—On ethylenic chlorosulphocyanide and its oxidation into ethylenic chlorosulphonic acid, by J. W. James.—On mixing and heating potassium sulphocyanide with alcohol and chlorobromide of ethylene, potassium bromide, and chlorosulphocyanide of ethylene were obtained. The latter with nitric acid gave chloroethylene sulphonic acid, the silver salt of which heated with ammonia furnished taurin.—On the boiling points of certain metals and metallic salts, by Dr. T. Carnelly and Dr. W. Carleton Williams.

Linnean Society, June 19.—Prof. Allman, F.R.S., president, in the chair.—Attention was called to two volumes folio on the British fresh water fishes by the Rev. W. Houghton. These, recently issued, illustrate in colours all the known and new species.—The Secretary read a paper on a remarkable branched *Syllis* from the *Challenger* expedition, by Dr. W. C. McIntosh. This Polychaete worm *S. ramosa* was got in the basal canals of a hexactinellid sponge, dredged near Zebu, Philippines. Thread-like in thickness, the branches are intricately arranged among the meshes of the sponge, and it appears that but one head must serve for many branches. Buds and secondary buds are very numerous on the latter, and in a free female pedal bristle-tufts were observed. A fragment of a different form is suggested, as possibly the male of the foregoing rare example of a truly branched annelid, differing in most particulars from anything heretofore recorded.—There followed remarks on *Carpesium* (*C. cernuum*) as indigenous to Australia, by F. M. Bailey. The author supports Mr. Bernay's view of this plant not being introduced, but undoubtedly endemic.—Mr. A. Hammond read a paper on the thorax of the blowfly. Most authorities at present recognise the great preponderance of the mesothorax over the other two segments, but do not fix the limits of each. The author refers to the integumentary parts entering into the thorax of insects, as enumerated by Audouin, and also especially to the views held by Westwood, Burmeister, Lowne, and others. Afterwards he gives a full description of his own dissections and preparations, and reasons for dissent from the majority of workers, though with evident inclination to Audouin's opinions. He concludes that, from the analogy presented by other insects, from the evidence derivable from the phenomena of developmental change, and from a study and consideration of the nervous and muscular systems all combine to show that the thorax of the Diptera, as illustrated in the blowfly, is almost exclusively mesothoracic, a conviction quite at



variance with that promulgated by Lowne in his researches on the blowfly.—The Rev. J. M. Crombie gave an enumeration of the lichens in the herbarium of the late Rob. Brown in the British Museum. These were collected 1802-5 during the notable voyage of Capt. Flinders to New Holland and Tasmania. No complete catalogue of these lichens was published by Brown, though many bear his MS. names, and only the more common species were indicated in the Appendix to the above voyage. A paucity of "saxicole" species in this as in more recent collections of exotic lichens is to be regretted.—Mr. G. Busk read a paper on recent species of Heteropora, founded chiefly on material got in the *Challenger* Expedition. Hitherto material for a knowledge of these has been among fossil forms, but quite lately Mr. Waters has drawn attention to a recent example in the British Museum, said to be from Japan. Mr. Busk now considerably adds to our information on the living types, and enters into several structural peculiarities observed by him.—The abstract of a contribution to the flora of Northern China, by Messrs. J. G. Baker and S. Le M. Moore was read. Some 600 specimens now deposited in the Kew herbarium, and collected by Mr. John Ross in the province of Selim King 40° to 42° N. lat. of the Celestial Empire, furnish the basis of this botanical contribution. Though many species among these are already known, yet the discovery of such forms as *Exochorda serratifolia*, an addition to a genus that has for years remained monotypic—*Saxifraga Rossii*, *Brachylites paridiformis*, and *Betula exaltata*—along with several altogether new species, render the collection valuable. These form a good adjunct to the researches on this relatively unfrequented region; but a knowledge of which is rapidly being accumulated, chiefly through the labours of Maximowicz, Hance, and Franchet.—The Rev. J. M. Crombie briefly indicated the substance of a reply by him to Dr. Stirtton's remarks on his paper on the *Challenger* lichens.—Then followed a paper by Pastor H. D. J. Wallengren (of Sweden), on the species of Caddis flies (*Phryganea*) described by Linnaeus in his "Fauna Suecia," with notes on, and communicated, by Mr. R. McLachlan. In this communication some twenty-five species undergo a critical revision and determination as identified from the living insects and Swedish entomological collections. Mr. McLachlan, however, does not concur with all the Pastor's conclusions.—On the Bell Bird, by Dr. J. Murie, was a paper taken as read.—Mr. Chas. Holme (Bradford) was elected a Fellow of the Society.

## PARIS

**Academy of Sciences, June 23.**—M. Daubrée in the chair.—The following papers were read:—On the absorption, by the atmosphere, of ultra-violet radiations, by M. Cornu. That the solar spectrum extends beyond what the most favourable observations present of it, seems probable from its almost sudden termination on the most refrangible side (in photographs), and the results of comparing this spectrum with that of iron vapour in the electric arc. The atmospheric absorption of ultra-violet radiations is demonstrated by introducing a tube 4 m. long, closed at the ends with fluor spar, between the collimator and the prism of a spectroscope. When the tube is full of air, line 32 of the aluminium spectrum (from electrodes of that metal transmitting the induction-spark) is invisible; but as vacuum is gradually produced, the line appears.—Remarks on a note of Admiral Mouchez, by M. Faye. He argues against the watch-makers being called on to determine experimentally the thermometric correction of the instruments they supply to merchant vessels. These vessels should have the same advantages as the navy in this respect.—Action of so-called poisons of the heart on the snail (*Helix pomatia*), by M. Vulpian. Alcoholic extract of onaye (*Strophantus hispidus*, D.C.), was taken as type of poisons stopping the heart with the ventricle in systole; *muscarine*, with the heart in diastole. The action in both cases was similar to that in frogs. The antagonism observed in mammalia between the effects of *muscarine* and those of sulphate of atropine, was also observed in snails. The hearts of crustaceans were not, apparently, affected by the two typical poisons named.—On an arithmetical property of a certain series of whole numbers, by Prof. Sylvester.—Inexact application of a theorem of dynamics, by MM. Bertin and Garbe, to explain the motion of the vanes of a radiometer. He disputes the assertion that the motion is produced solely by gaseous matters within the globe (the inference drawn by the authors named from a dynamical theorem). Considering the cause of motion complex, he suggests experiment in the direction of varying the substance and surfaces of the vanes with special regard to the calorific and lumi-

nous properties of the materials used; altering the luminous rays especially by polarising them in different directions relatively to the vanes; suspending the globe on two very fine points and inclosing it in a receiver exhausted of air.—On the means of working automatically the upper tube of the economising apparatus constructed at the sluice of Aulois, by M. de Caligny.—On the interoceanic maritime canal, by M. de Lesseps. Some preparatory operations are mentioned. Dr. Companyo, of Perpignan, who directed an important sanitary service in the Suez Canal works, has been sent to Panama to study the best means of preserving the health of workmen; and agents and correspondents have been charged to enlist the most suitable workmen in America.—M. Lissajous was elected Correspondent in Physics, in room of the late Dr. von Mayer.—Map of the solar spectrum, by M. Thollon. This new map, made with the aid of his powerful spectroscope in Italy, is 10 metres long, and contains about 4,000 lines (Ångström's contained 1,600 in a length of 3 metres). M. Thollon remarks on the singular resemblance of the groups A and B, and gives a four-fold classification of solar lines, viz.: 1. Nebulosity without nucleus. 2. Nucleus without nebulosity. 3. Nebulosity predominating. 4. Nucleus predominating. He describes the instruments [with which he operated].—On the reappearance of phylloxera in vineyards subjected to insecticide operations, by M. Marion.—On the positions of the Comet Tempel II., 1867, deduced from four first observations at the observatory of Rio de Janeiro, by M. Cruls.—Resolution of systems of linear congruences, by M. Demeczyk de Gyergyszentmiklos.—Addition to a previous note on the series of Laplace, by M. de Saint Germain.—Study of the molecular constitution of liquids by means of their coefficient of expansion, their specific heat, and their atomic weight, by M. Pictet.—Explanation of the bolide at Geneva on June 7, 1879, by M. Ultramare. He considers such a phenomenon arises from electricity detaching a portion of the electrified cloud.—Study on alloys of lead and antimony and especially on the liquations and supersaturations they present, by M. De Jussieu.—On the production of hydrocellulose, by M. Girard. He gives three methods of producing it.—On the retrogradation of superphosphates, by M. Joulie.—On the respiratory apparatus of Ampullaria, by M. Sabatier.—Experimental researches on the therapeutic value of intravenous injections of milk, by MM. Bechamp and Baltus. The transfusion of milk within certain quantitative limits (comparatively extended) is harmless in the dog, but has too little therapeutical value to be substituted for transfusion of blood.—On the total absence of amnions in the embryos of the hen, by M. Dareste.—Prof. Draper presented a photograph of the solar spectrum and that of oxygen.

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